

WHAT IS CLAIMED IS:

1. A method of recording, onto a guide track of an information record medium, control information to control at least one of recording and reproducing operations of record information on said information record medium, said method comprising the steps of:

generating a control information timing signal one after another at an interval corresponding to a length of a control information unit equal to an  $N$  ( $N$ : predetermined integer not less than 2) multiple of a length of a record information unit of the record information; and

recording the control information onto the guide track of said information record medium, on the basis of a timing corresponding to the control information timing signal.

2. A method according to claim 1, wherein

the control information is pre-information including at least address information indicative of a record position on said information record medium of the record information,

the record information unit is one synchronization frame, and  
in said generating step, the control information timing signal is generated by doubling said one synchronization frame.

3. A method according to claim 1, wherein

the control information has a length along the guide track equal to an integer multiple of a unit length corresponding to a pit

interval along the guide track defined by a recording format of the record information, for a record pit to be formed on said information record medium in correspondence with the record information in the recording operation, and

in said recording step, the control information is recorded for each control information unit, by a control information pit having a length shorter along the guide track than the shortest pit length of the record pit.

4. A method according to claim 1, wherein

in said generating step, the control information timing signal is generated at such an interval that positions of the control information recorded on adjacent turns of the guide track are not on a straight line perpendicular to the guide track on said information record medium.

5. A method according to claim 1, wherein said generating step comprises the steps of:

generating an even timing signal, as a first kind of the control information timing signal corresponding to an even numbered record information unit in a record information unit row comprising M (M: predetermined integer not less than 2) record information units;

generating an odd timing signal, as a second kind of the control information timing signal corresponding to an odd numbered record information unit in the record information unit row; and

selecting one of the even and odd timing signals such that positions of the control information recorded on adjacent turns of the guide track are not on a straight line perpendicular to the guide track on said information record medium,

in said recording step, the control information is recorded onto the guide track of said information record medium, on the basis of a timing corresponding to the selected one of the even and odd timing signals.

6. A method according to claim 5, wherein said selecting step comprises the steps of:

storing the selected one of the even and odd timing signals for one turn of the guide track; and

selecting one of the even and odd timing signals for another turn of the guide track next to said one turn, on the basis of the stored one of the even and odd timing signals.

7. An apparatus for recording, onto a guide track of an information record medium, control information to control at least one of recording and reproducing operations of record information on said information record medium, said apparatus comprising:

a generating unit for generating a control information timing signal one after another at an interval corresponding to a length of a control information unit equal to an  $N$  ( $N$ : predetermined integer not less than 2) multiple of a length of a record information unit of the record information; and

a recording unit for recording the control information onto the guide track of said information record medium, on the basis of a timing corresponding to the control information timing signal.

8. An apparatus according to claim 7, wherein

the control information is pre-information including at least address information indicative of a record position on said information record medium of the record information,

the record information unit is one synchronization frame, and said generating unit generates the control information timing signal by doubling said one synchronization frame.

9. An apparatus according to claim 7, wherein

the control information has a length along the guide track equal to an integer multiple of a unit length corresponding to a pit interval along the guide track defined by a recording format of the record information, for a record pit to be formed on said information record medium in correspondence with the record information in the recording operation, and

said recording unit records the control information for each control information unit, by a control information pit having a length shorter along the guide track than the shortest pit length of the record pit.

10. An apparatus according to claim 7, wherein

said generating unit generates the control information

timing signal at such an interval that positions of the control information recorded on adjacent turns of the guide track are not on a straight line perpendicular to the guide track on said information record medium.

11. An apparatus according to claim 7, wherein said generating unit comprises:

a first generating device for generating an even timing signal, as a first kind of the control information timing signal corresponding to an even numbered record information unit in a record information unit row comprising M (M: predetermined integer not less than 2) record information units;

a second generating device for generating an odd timing signal, as a second kind of the control information timing signal corresponding to an odd numbered record information unit in the record information unit row; and

a selecting device for selecting one of the even and odd timing signals such that positions of the control information recorded on adjacent turns of the guide track are not on a straight line perpendicular to the guide track on said information record medium,

said recording unit records the control information onto the guide track of said information record medium, on the basis of a timing corresponding to the selected one of the even and odd timing signals.

12. An apparatus according to claim 11, wherein said selecting

device comprises:

- a memory for storing the selected one of the even and odd timing signals for one turn of the guide track; and

- a selector for selecting one of the even and odd timing signals for another turn of the guide track next to said one turn, on the basis of the stored one of the even and odd timing signals.

13. An information record medium comprising:

- a substrate having an information record surface;

- an information record track formed on said information record surface in a spiral or coaxial shape, for recording record information;

- a guide track formed on said information record surface in parallel to said information record track, for guiding a light beam, which is to perform at least one of recording and reproducing operations of the record information, to said information record track; and

- a control information for controlling at least one of the recording and reproducing operations, recorded on said guide track at an interval corresponding to a length of a control information unit equal to an  $N$  ( $N$ : predetermined integer not less than 2) multiple of a length of a record information unit of the record information.

14. An information record medium according to claim 13, wherein the control information is pre-information including at least address information indicative of a record position on said

information record surface of the record information,

the record information unit is one synchronization frame, and

the pre-information is recorded on said guide track for each pre-information unit, which is obtained by doubling said one synchronization frame.

15. An information record medium according to claim 13, wherein the control information has a length along the guide track equal to an integer multiple of a unit length corresponding to a pit interval along the guide track defined by a recording format of the record information, for a record pit to be formed on said information record surface in correspondence with the record information in the recording operation, and

the control information is recorded for each control information unit, by a control information pit having a length shorter along the guide track than the shortest pit length of the record pit.

16. An information record medium according to claim 13, wherein positions of the control information recorded on adjacent turns of the guide track are not on a straight line perpendicular to the guide track on said information record surface.

17. An information record medium according to claim 13, further comprising the record information, which is recorded on said information record track by a record pit formed in correspondence

with the record information in the recording operation and which has a synchronization signal for achieving a synchronization in the reproducing operation, wherein

the control information has a length along the guide track equal to an integer multiple of a unit length corresponding to a pit interval along the guide track defined by a recording format of the record information,

the control information is recorded for each control information unit, by a control information pit having a length shorter along the guide track than the shortest pit length of the record pit, and

positions of the control information and the synchronization signal recorded on adjacent turns of the guide track and the information record track are on a straight line perpendicular to the guide track on said information record surface.

18. A method of recording record information onto information record medium, said information record medium comprising: a substrate having an information record surface; an information record track formed on said information record surface in a spiral or coaxial shape, for recording the record information; a guide track formed on said information record surface in parallel to said information record track, for guiding a light beam, which is to perform at least one of recording and reproducing operations of the record information, to said information record track; and a control information for controlling at least one of the recording and



reproducing operations, recorded on said guide track at an interval corresponding to a length of a control information unit equal to an  $N$  ( $N$ : predetermined integer not less than 2) multiple of a length of a record information unit of the record information, said method comprising the steps of:

detecting the control information from said information record medium;

generating the record information on the basis of a record signal inputted from the external such that a synchronization signal is added to each record information unit in correspondence with the detected control information; and

recording the generated record information onto the information record track.

19. An apparatus for recording record information onto information record medium, said information record medium comprising: a substrate having an information record surface; an information record track formed on said information record surface in a spiral or coaxial shape, for recording the record information; a guide track formed on said information record surface in parallel to said information record track, for guiding a light beam, which is to perform at least one of recording and reproducing operations of the record information, to said information record track; and a control information for controlling at least one of the recording and reproducing operations, recorded on said guide track at an interval corresponding to a length of a control information unit

equal to an  $N$  ( $N$ : predetermined integer not less than 2) multiple of a length of a record information unit of the record information, said apparatus comprising:

a detecting unit for detecting the control information from said information record medium;

a record information generating unit for generating the record information on the basis of a record signal inputted from the external such that a synchronization signal is added to each record information unit in correspondence with the detected control information; and

a recording unit for recording the generated record information onto the information record track.